



(21) (A1) **2,297,449**

(22) 1994/08/17

(43) 1996/02/18

(62) 2,130,297

(22) 1994/08/17

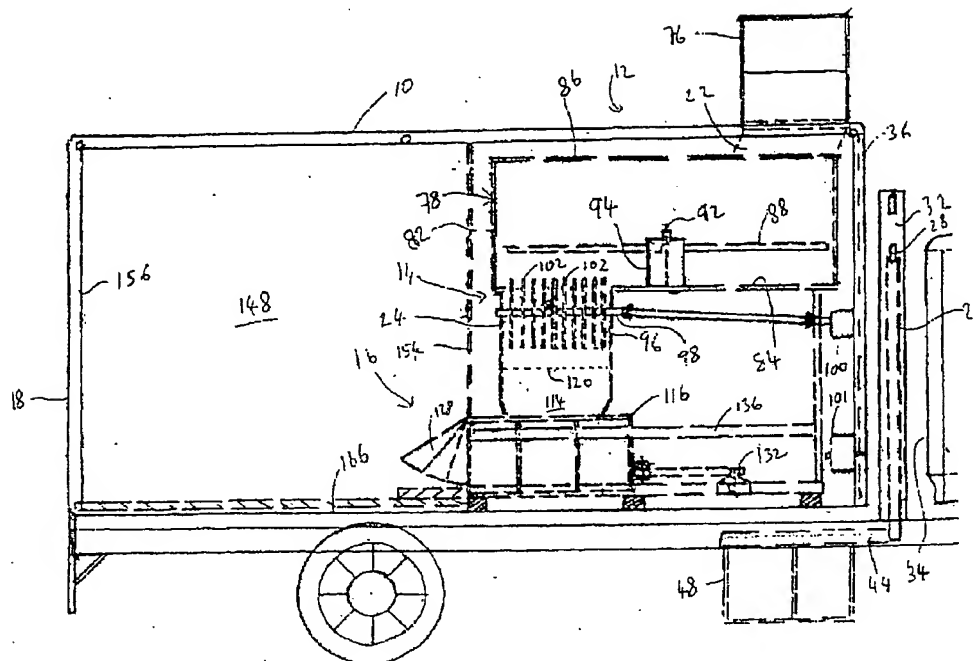
(72) RAJEWSKI, DAVID EDWARD, CA

(71) RAJEWSKI, DAVID EDWARD, CA

(51) Int. Cl.⁷ B02C 13/00

(54) **DECHIQUETEUSE A PAPIER SUR CAMION**

(54) **MOBILE PAPER SHREDDER**



(57) A truck mounted mobile paper shredder with high shredding rate incorporates a hammer mill, with a sweeping arm in a tub feeding the mill. A lifting arm lifts paper containers to an inverted position over the tub to feed paper into the tub. The hammer mill, with striking angle less than 30° feeds paper into a compactor with reciprocating plunger. Compacted shredded paper passes through a movable wall into a storage area having an unloading gate. Movement of the movable wall forces compacted shredded paper out of the unloading gate.



ABSTRACT OF THE DISCLOSURE

5 A truck mounted mobile paper shredder with
a high shredding rate incorporates a hammer mill, with
a sweeping arm in a tub feeding the mill. A lifting
arm lifts paper containers to an inverted position
over the tub to feed paper into the tub. The hammer
mill, with striking angle less than 30° feeds paper
10 into a compactor with reciprocating plunger. Compacted
shredded paper passes through a movable wall into a
storage area having an unloading gate. Movement of the
movable wall forces compacted shredded paper out of
the unloading gate.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

- 5 1. A paper shredding apparatus, comprising:
 a paper feeder having an inlet and an outlet
 and a direction of feed towards the outlet;
 a shredder connected to receive paper from
 the outlet of the paper feeder, the paper shredder
10 including an opening bounded at least on one side by
 impact surfaces, plural hammers mounted about a
 horizontal axis for rotation within the opening past
 the impact surfaces, the striking angle of the plural
 hammers being less than 30° at impact, and a shredded
15 paper outlet; and
 an unloader mounted to receive shredded
 paper from the shredded paper outlet of the shredder.
- 20 2. The paper shredding apparatus of claim 1 in
 which:
 the feeder has a lower confining surface
 forming a predominantly horizontal plane;
 the horizontal axis on which the plural
 hammers are mounted lies below the horizontal plane;
25 and
 the direction of feed is along the lower
 confining surface of the feeder towards the opening in
 the shredder.
- 30 3. The paper shredding apparatus of claim 1 in
 which the unloader includes:
 a bin formed of a base, first and second
 sidewalls spaced from each other and separated by the
 base, a reciprocating end wall disposed between the

first and second sidewalls, and an upwardly extending discharge chute opposed to the reciprocating end wall; and

5 a motor operatively connected to the reciprocating end wall such that reciprocation of the end wall compacts shredded paper within the bin and forces it out of the discharge chute.

4. The paper shredding apparatus of claim 3 in
10 which the unloader further includes:

 a shredded paper storage area bounded by walls, one of the walls being openable and forming an unloading gate, and one of the walls being movable across the storage area towards the openable wall, the
15 discharge chute disposed to discharge paper into the storage area through one of the walls.

5. The paper shredding apparatus of claim 1 in
20 which the paper feeder includes a tub formed of an encircling wall, and a lower and upper confining surface, the inlet being formed in the upper confining surface and the outlet being formed in the lower confining surface, the paper feeder including a sweeping arm mounted for rotation in the tub and to
25 sweep across the lower confining surface between the encircling wall.

6. The paper shredding apparatus of claim 1 further including:

30 a lifting arm mechanism for lifting and rotating initially upright paper containers to empty the paper containers into the paper feeder.

7. The paper shredding apparatus further including:

5 the paper feeder including a tub formed of an encircling wall, and a lower and upper confining surface, the lower confining surface forming a predominantly horizontal plane, the inlet being formed in the upper confining surface and the outlet being formed in the lower confining surface, the paper feeder including a sweeping arm mounted for rotation
10 in the tub and to sweep across the lower confining surface between the encircling wall;

the horizontal axis on which the plural hammers are mounted lying below the horizontal plane of the lower confining surface;

15 the direction of feed being along the lower confining surface of the feeder towards the opening in the shredder;

the unloader including a bin formed of a base, first and second sidewalls spaced from each other and separated by the base, a reciprocating end wall disposed between the first and second sidewalls, and a discharge chute opposed to the reciprocating end wall, and a motor operatively connected to the reciprocating end wall such that reciprocation of the
20 end wall compacts shredded paper within the bin and forces it out of the discharge chute;

25 the unloader further including a shredded paper storage area bounded by walls, one of the walls being openable, and one of the walls being movable across the storage area towards the openable wall, the discharge chute disposed to discharge paper into the
30 storage area through one of the walls; and

a lifting arm mechanism for lifting and rotating initially upright paper containers to empty the paper containers into the paper feeder.

5 8. The paper shredding apparatus of claim 1 further including a governor connected between the shredder and the paper feeder to regulate feeding of the rate at which paper is fed into the paper shredder.

10

9. The paper shredding apparatus of claim 5 further including a governor connected between the paper shredder and the paper feeder to regulate feeding of the rate at which paper is fed into the paper shredder.

15

10. A paper shredding apparatus, comprising:
a paper feeder having an inlet and an outlet;

20

a shredder connected to receive paper from the outlet of the paper feeder, the paper shredder including an opening bounded at least on one side by impact surfaces, and a shredded paper outlet;

25 an unloader mounted to receive shredded paper from the shredded paper outlet of the shredder, the unloader including (1) a bin formed of a base, first and second sidewalls spaced from each other and separated by the base, a reciprocating end wall disposed between the first and second sidewalls, and
30 a discharge chute opposed to the reciprocating end wall; and (2) a motor operatively connected to the reciprocating end wall such that reciprocation of the end wall compacts shredded paper within the bin and forces it out of the discharge chute.

11. The paper shredding apparatus of claim 10 in which the unloader further includes:

5 a shredded paper storage area bounded by walls, one of the walls being openable, and one of the walls being movable across the storage area towards the openable wall, the discharge chute disposed to discharge paper into the storage area through one of the walls.

10 12. The paper shredding apparatus of claim 11 in which the discharge chute is upwardly extending.

13. The paper shredding apparatus of claim 11 in which the paper feeder includes a tub formed of an encircling wall, and a lower and upper confining surface, the inlet being formed in the upper confining surface and the outlet being formed in the lower confining surface, the paper feeder including a sweeping arm mounted for rotation in the tub and to sweep across the lower confining surface between the encircling wall; and further including:

20 a lifting arm mechanism for lifting and rotating initially upright paper containers to empty the paper containers into the tub of the paper feeder.

25

14. The paper shredding apparatus of claim 10 further including:

30 a lifting arm mechanism for lifting and rotating initially upright paper containers to empty the paper containers into the paper feeder.

15. The paper shredding apparatus of claim 10 in which the paper feeder includes a tub formed of an encircling wall, and a lower and upper confining

surface, the inlet being formed in the upper confining surface and the outlet being formed in the lower confining surface, the paper feeder including a sweeping arm mounted for rotation in the tub and to sweep across the lower confining surface between the encircling wall.

16. The paper shredding apparatus of claim 10 further including:

10 a lifting arm mechanism for lifting and rotating initially upright paper containers to empty the paper containers into the paper feeder.

17. A paper shredding apparatus, comprising:
15 a paper feeder having an inlet and an outlet, the paper feeder including a tub formed of an encircling wall, and a lower and upper confining surface, the inlet being formed in the upper confining surface and the outlet being formed in the lower
20 confining surface, the paper feeder including a sweeping arm mounted for rotation about a vertical axis in the tub and to sweep across the lower confining surface between the encircling wall;

a shredder connected to receive paper from
25 the outlet of the paper feeder, the paper shredder including an opening bounded at least on one side by impact surfaces, and a shredded paper outlet; and

an unloader mounted to receive shredded
paper from the shredded paper outlet of the shredder.

30

18. The paper shredding apparatus of claim 17 further including:

a lifting arm mechanism for lifting and rotating initially upright paper containers to empty the paper containers into the paper feeder.

5 19. The paper shredding apparatus of claim 18 in which the lifting arm mechanism includes:

 a lifting arm mounted about a horizontal axis and rotatable from a lower position for attaching a paper container onto the lifting arm to an upper discharge position, the lifting arm having a free end;

10 a detachable latch for a paper container on the free end of the lifting arm; and

 means to rotate the paper container into an emptying position.

15

20. A paper shredding apparatus, comprising:

 a paper feeder having an inlet and an outlet;

 a lifting arm mechanism for lifting and rotating initially upright paper containers to empty the paper containers into the paper feeder;

20 a shredder connected to receive paper from the outlet of the paper feeder, the paper shredder including an opening bounded at least on one side by impact surfaces, and a shredded paper outlet; and

25 an unloader mounted to receive shredded paper from the shredded paper outlet of the shredder.

30 21. The paper shredding apparatus of claim 20 in which the lifting arm mechanism includes:

 a lifting arm mounted about a horizontal axis and rotatable from a lower position for attaching a paper container onto the lifting arm to an upper discharge position, the lifting arm having a free end;

a detachable latch for a paper container on the free end of the lifting arm; and means to rotate the paper container into an emptying position.

5

22. A method of shredding paper using a mobile paper shredder having an unloading gate, the method comprising the steps of:

10 feeding paper into a paper shredder mounted on a motor vehicle;

shredding the paper to produce shredded paper;

compacting the shredded paper to produce compacted shredded paper; and

15 periodically moving the compacted shredded paper towards and out of the unloading gate.

23. The method of claim 22 in which:

20 feeding the paper includes feeding the paper into the paper shredder along a direction of feed; and

shredding the paper includes impacting the paper with hammers whose striking angle is less than 30°.

25 24. The method of claim 22 in which the paper shredder is located in a lower confining surface of a tub and feeding the paper into the paper shredder includes:

30 loading paper into the tub by lifting the paper in a paper container on a lifting arm to a point above the tub, and rotating the paper container to discharge the paper into the tub.

23

25. The method of claim 24 in which feeding the paper into the paper shredder includes moving paper in the direction of feed with a rotating arm mounted on a central vertical axis in the tub.

5

26. The method of claim 22 in which compacting the shredded paper includes:

10 depositing shredded paper in a bin formed of a base, first and second sidewalls spaced from each other and separated by the base, a reciprocating end wall disposed between the first and second sidewalls, and a discharge chute opposed to the reciprocating end wall; and

15 reciprocating the end wall towards and away from the discharge chute.

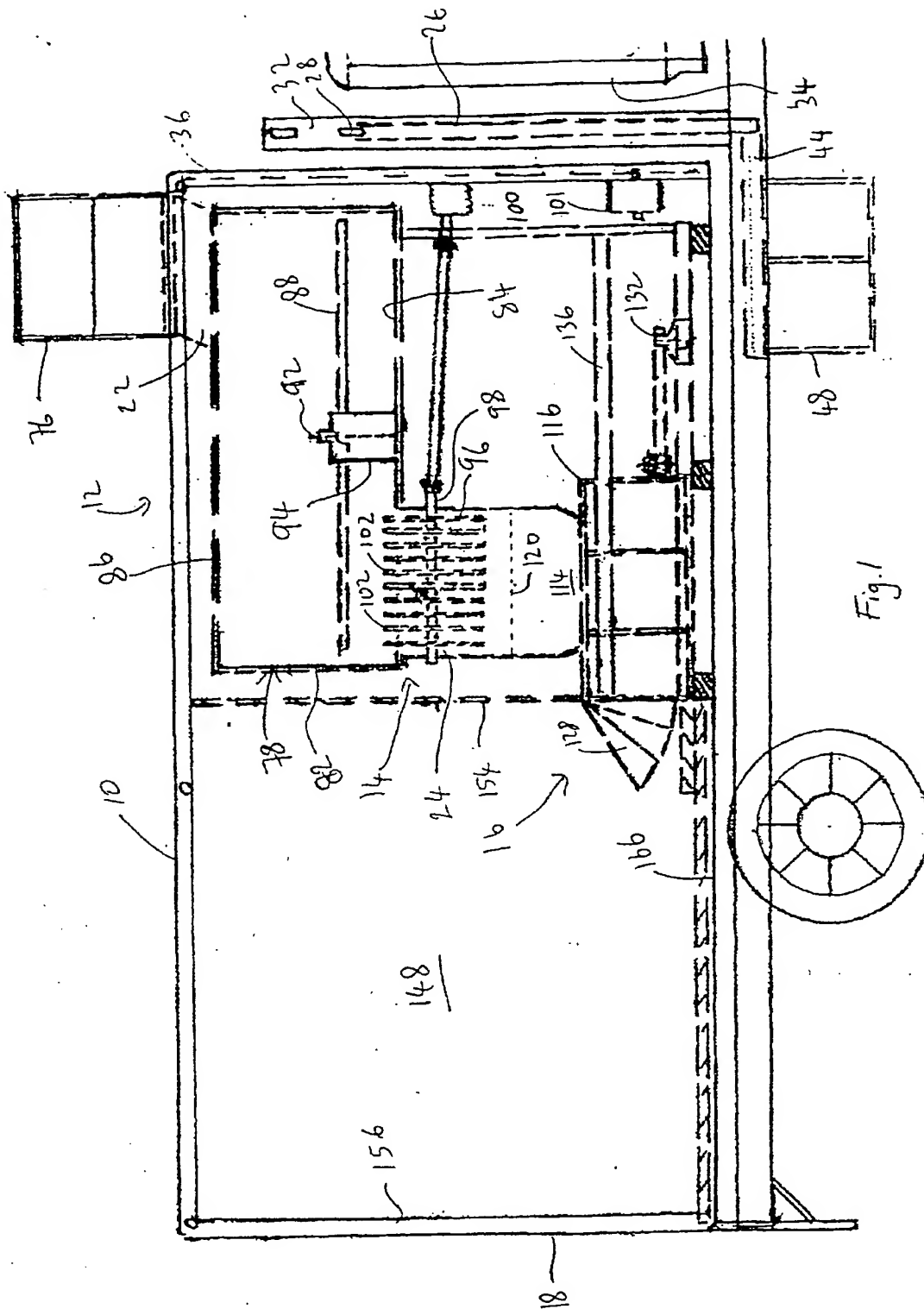
27. The method of claim 22 in which periodically moving the compacted shredded paper includes:

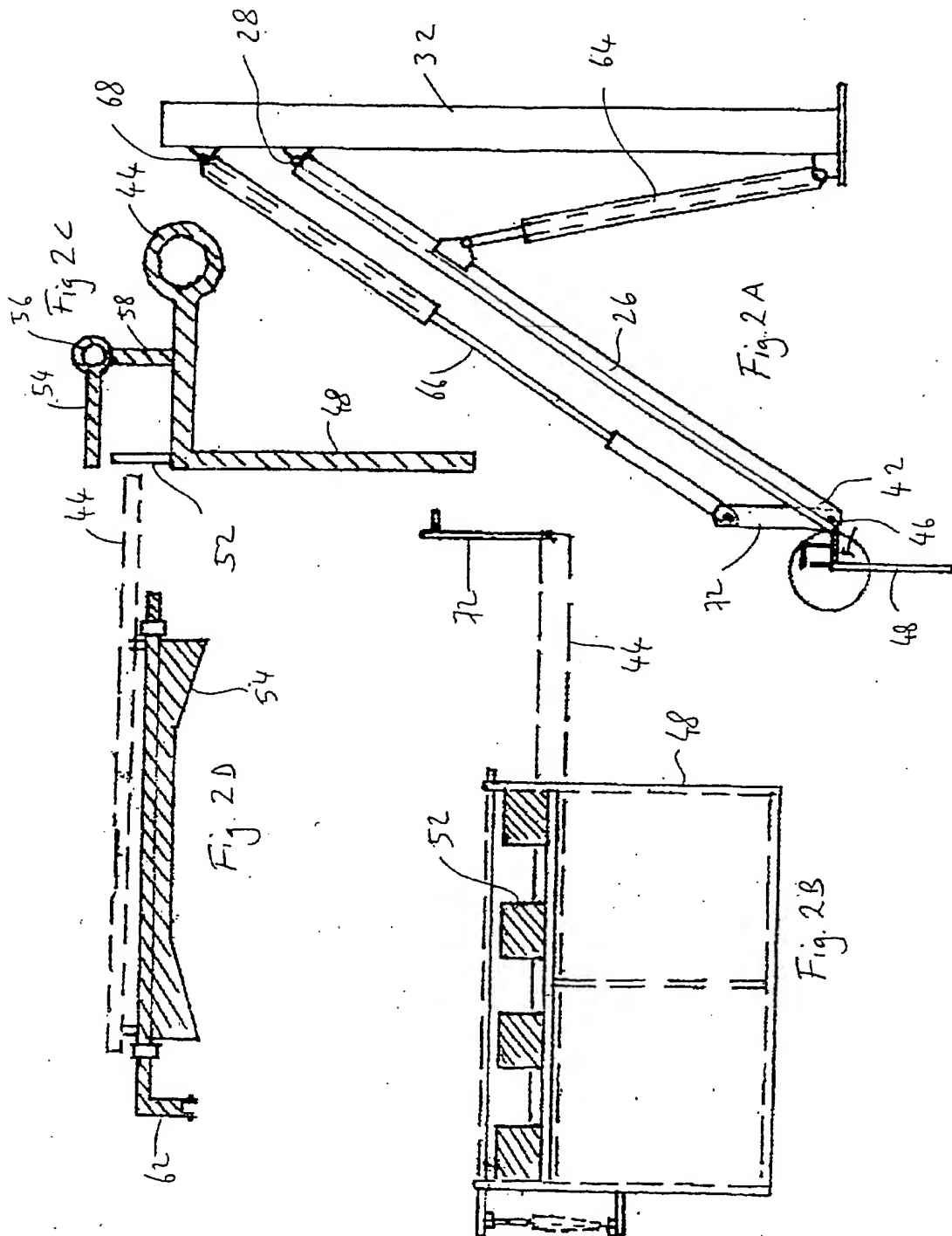
20 depositing compacted shredded paper on one side of a moving wall; and

periodically moving the moving wall towards the unloading gate.

25 28. The method of claim 22 in which the paper shredder is a hammer mill and further including regulating the rate of feed of paper into the hammer mill according to the speed of rotation of the hammer mill.

30





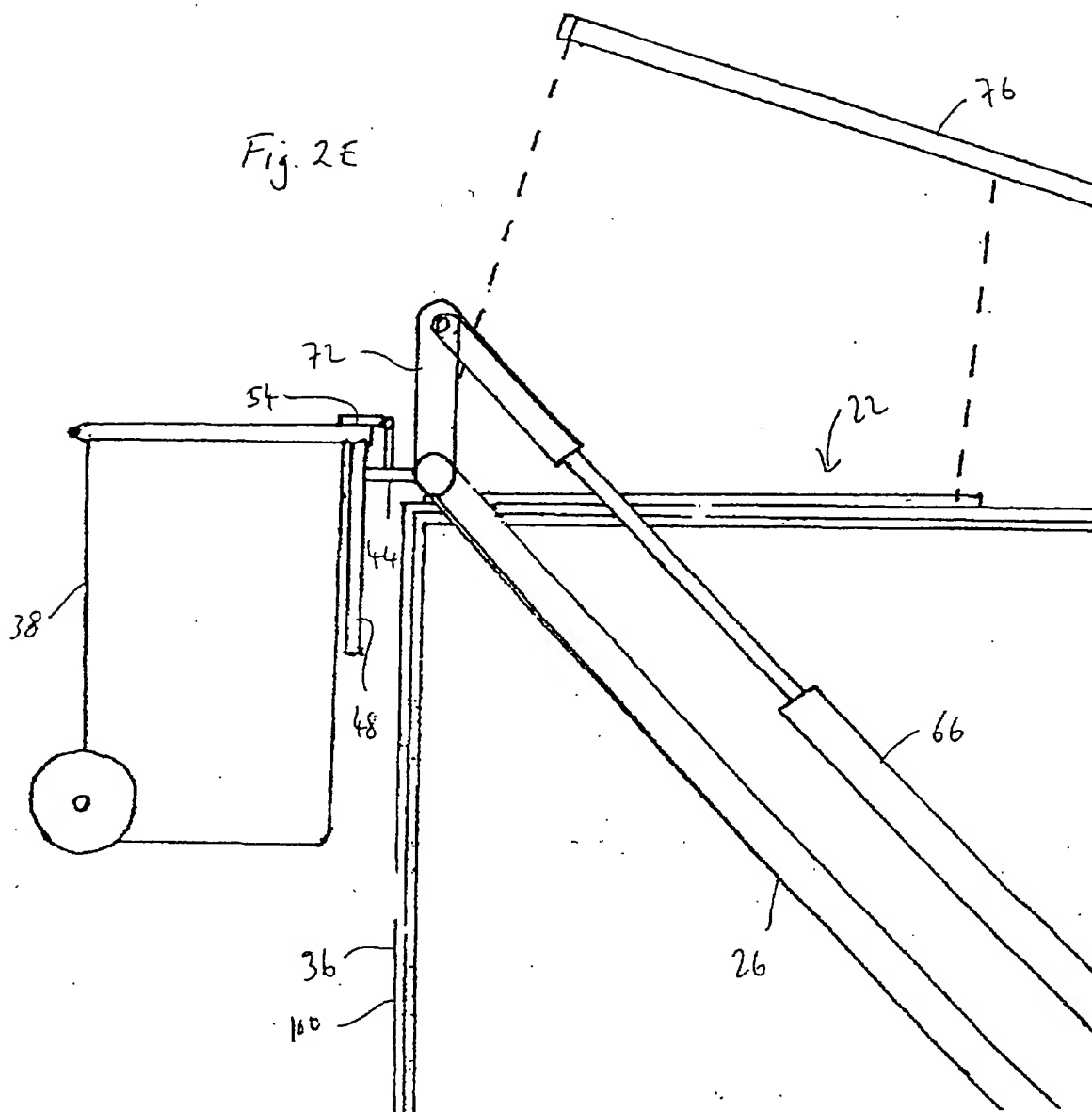
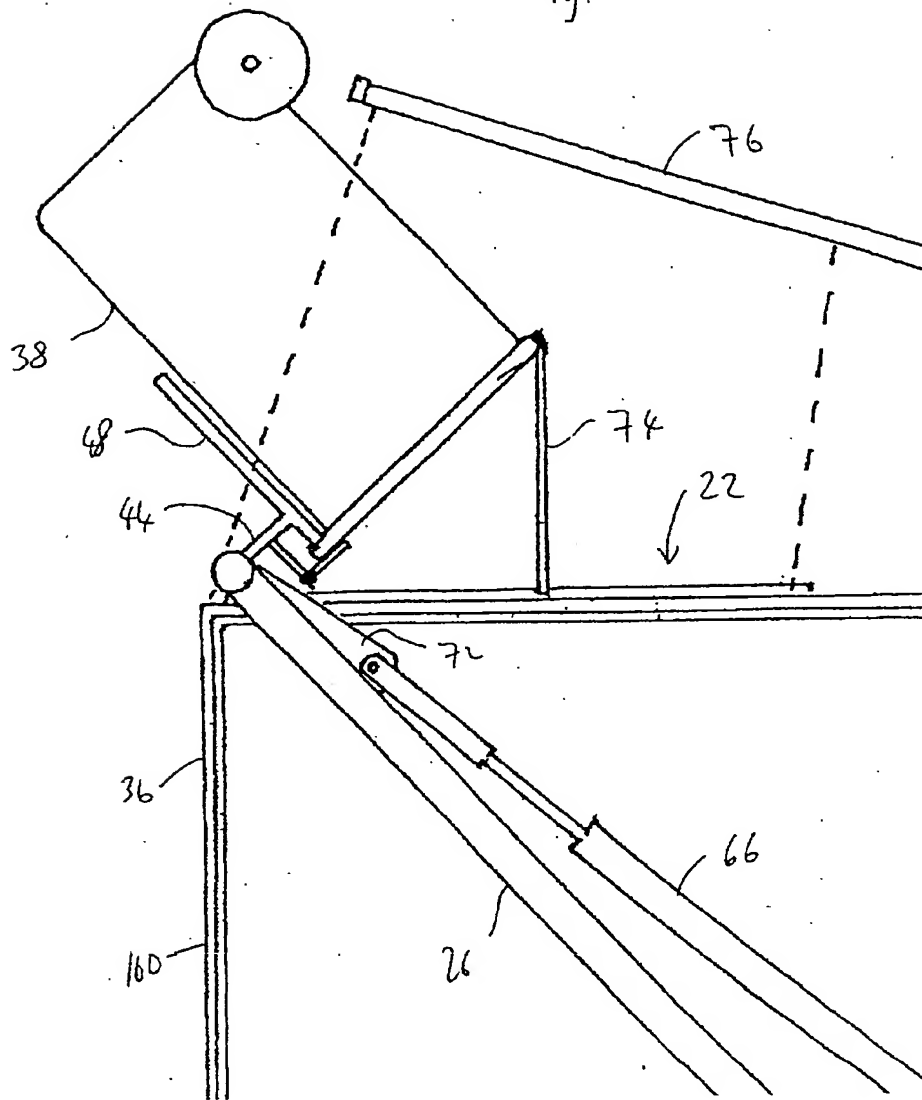


Fig. 2F



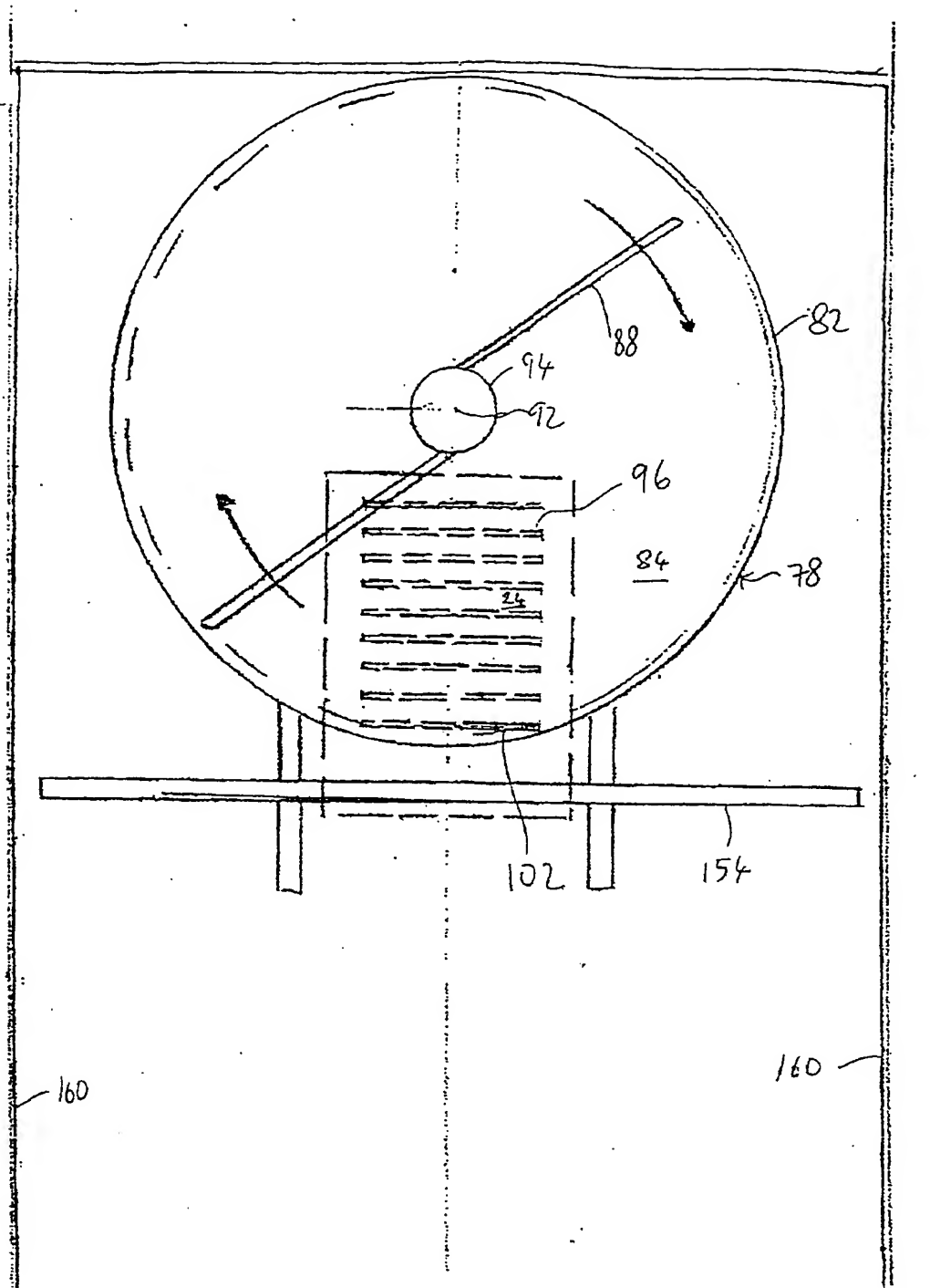
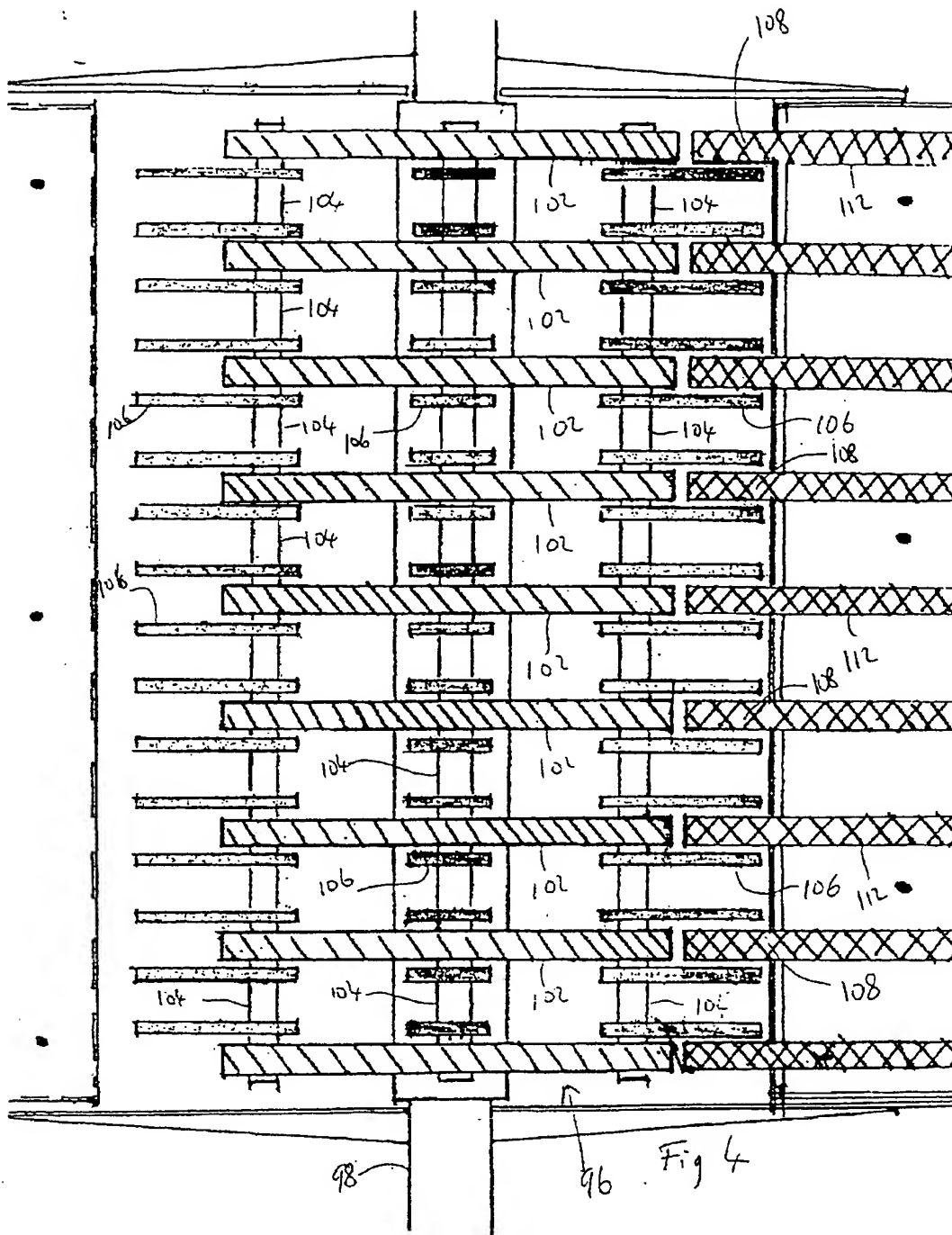


Fig. 3



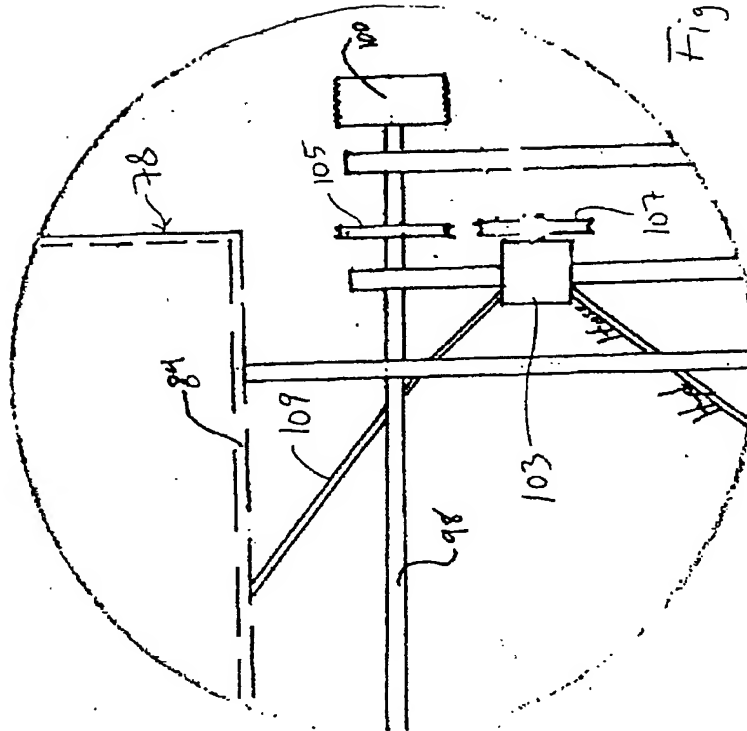


Fig. 4A

